

Appl. NO. 09/821,858

Amendment Dated: October 6, 2003

Reply to Office action of May 7, 2003

Remarks:

Reconsideration of the application is requested. Claims 1-2 and 5-10 are now in the application. Claims 1, 7, and 10 have been amended. Claims 3 and 4 have been canceled. Claims 11-13 have been withdrawn.

As requested in claim 3 of the Office action, the election of Group I: Claims 1-10 is affirmed. Claims 11-13 have been withdrawn.

In item 6 of the above-identified Office action, the Examiner has rejected claims 7 and 10 as being indefinite under 35 U.S.C. § 112, second paragraph. More specifically, the Examiner has stated that the claims recite method limitations that are not tied to the structural elements of the claims.

Claims 7 and 10 have been amended to define structural elements performing the claimed steps. Support for the changes to Claim 7 can be found in Fig. 3 and page 17, line 19, through page 18, line 8, of the specification. Changes to claim 10 can be found in Fig. 1, page 11, lines 21-26, and page 20, line 16, through page 21, line 3, of the specification.

Accordingly, the specification and the claims meet the requirements of 35 U.S.C. § 112, first and second paragraphs.

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Should the Examiner find any further objectionable items, counsel would appreciate a telephone call during which the matter may be resolved. The changes are neither provided for overcoming the prior art nor do they narrow the scope of the claim for any reason related to the statutory requirements for a patent.

In item 7 of the Office action, the Examiner rejected claims 1, 3-5, 8, and 10 as being fully anticipated by Taylor et al. (U.S. 3,706,535) under 35 U.S.C. § 102(b). As will be explained below, the claim 4 was patentable over the cited art in its original form. Therefore, the features of claim 4 have been added to claim 1.

Before discussing the prior art in detail, a brief review of the invention as claimed is provided. Amended claim 1 calls for, *inter alia*, a device having the following features:

a heating chamber;

a number of heating elements for heating said heating chamber;

a number of flow pipes, each of said heating elements disposed within a respective one of said flow pipes;

a feed line for feeding a gas mixture having a hydrogen content with a parameter characteristic, into said heating chamber;

a blower connected in said feed line and having a delivery rate; and

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a control unit associated with said blower for adjusting the delivery rate of said blower in dependence on the parameter characteristic for the hydrogen content of the gas mixture.

The invention according to amended claim 1 allows the ratio of heat transfer surface versus a volume of gas flow to be treated to be chosen for a particularly effective catalytic recombination reaction.

In contrast, Tailor et al. do not teach separate flow pipes for each heating element. Furthermore, as admitted by the Examiner, in Tailor et al., the inner metallic jacket only vaguely suggests a flow pipe of the type described in claim 1 of the instant application.

Amended claim 1 expresses more clearly that the recombination device according to the application is directed towards a specifically demand-conforming decomposition of hydrogen in a gas mixture requiring treatment, in a relatively simple device. Such a demand-conforming decomposition of hydrogen, ensures a specifically high operational reliability. In addition, a device utilizing demand-conforming decomposition of hydrogen creates a particularly economical mode of operation, in which, a gas quantity depends on the hydrogen content of the gas mixture and, thus, on the need for treatment. To that end, the device according to the invention

provides for the detection of a characterizing parameter of the gas mixture that is directly used for rendering the blower and for adjusting its delivery rate.

On the other hand, an operational mode specifically directed towards need, is rendered possible with the now specified device in that the heating chamber provided for causing the recombination reaction is designed for a particularly effective heat input in the gas mixture requiring treatment and furthermore for comparatively short thermal reaction times and this for a particularly good controllability of the recombination rate. In order to guarantee that, the heating elements of the heating chamber are designed as heating rods that provide a comparatively large contact surface for transferring heat to the gas mixture. With the heating rods being guided in respectively assigned individual flow pipes, the flow path of the gas mixture is furthermore split into a plurality of flow paths connected in parallel to one another whereby in each case a particularly intensive contact of the gas mixture with the heating rod present in the respective flow pipe is guaranteed. Disposing the heating rods in individually assigned flow pipes reduces the flow volume remaining in the flow pipe relative to the heat exchange surface of the heating rods that is characteristic for the heating effect. Because this ratio is kept particularly low,

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the gas mixture in the flow pipe can be heated reliably, with particularly short heating and cooling times. Thus, an individual intervention on controllability of the individual heating rods can be performed in a topical manner so that the demand-conforming treatment of the gas mixture is particularly facilitated.

Therefore, because every feature of claim 1 (specifically, a plurality of flow pipes, each with a respective heating element) is not taught by the reference, Taylor et al. does not anticipate claim 1.

In item 8 of the Office action, the Examiner rejected claims 1, 2, 5, as being anticipated by Nishino (JP 64-020498) under § 102(b). Because the features of claim 4 have been added to claim 1, the rejection in light of Nishino is now moot.

In item 9 of the Office action, the Examiner rejected claims 1, 5, and 10 as being full anticipated by Goto et al. (JP 51-117193) under § 102(b). Because the features of claim 4 have been added to claim 1, the rejection in light of Goto et al. is now moot.

In item 10 of the Office action, the Examiner rejected claims 1, 2, 5-7, and 10 as being unpatentable over Henrie in view of

Nishino under 35 U.S.C. § 103(a). Because the features of claim 4 have been added to claim 1, the rejection is now moot.

In item 11 of the Office action, the Examiner rejected claims 3, 4, and 8 as being unpatentable over Henrie (U.S. 3,907,981) in view of Nishino and Saalfrank (DE 33 39 242) under 35 U.S.C. § 103(a).

However, one with ordinary skill in the art would have no motivation to combine the cited references. Henrie discloses a complete concept for a recombination device. Henries uses temperature parameters as reference variables as the control principle. Thus, this system is neither designed nor suited for being operated with a varying delivery rate of the blower, instead of the temperature parameters. In contrast, the proper operation of the system according to Henrie requires that the delivery rate be kept constant so that a proper adjustment of the temperature parameters is at all possible there. Furthermore, the system in Henrie is based on a specific design of the reaction chamber 6, as clearly documented, for example, in the last paragraph of column 2. Because of the design in the Henrie, an alteration of the design of this reaction chamber is not possible without substantially altering the basic concept disclosed therein so that the person of skill in the art is absolutely prevented from such considerations. The heater 4 mentioned by the

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Examiner for further argumentation is solely provided as a preheater for the gas mixture flowing into the reaction chamber 6. For that reason already, the heater 4 cannot be taken as a basis for the design of the heating elements now provided according to the invention, and the flow pipes assigned thereto. Thus, one with ordinary skill in the art has no incentive to build the heater 4 according to the concept disclosed in Saalfrank. Nor would one with ordinary skill in the art arrive, by taking such a step, at the system as now provided according to the invention, since even then, the design of the reaction chamber 6 had to remain the same.

Therefore, the reasons stated above, amended claim 1 of the instant application is not obvious over Henrie in view of Nishino and Saalfrank.

Accordingly, none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Therefore, claim 1 is patentable over the art. Moreover, because all of the dependent claims are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-2 and 5-10 are solicited. In the event the Examiner should still find any of the claims to be unpatentable, please

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telephone counsel so that patentable language can be substituted.

Petition for extension is herewith made. The extension fee for response within a period of two months pursuant to Section 1.136(a) in the amount of \$420 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



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